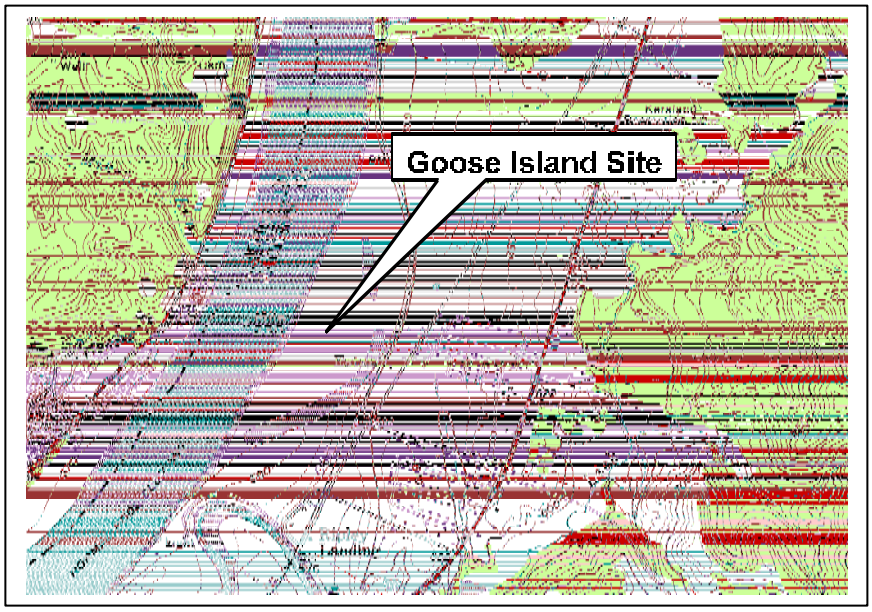
GOOSE ISLAND (WV-23)

1.0 Location

The proposed Goose Island restoration project area is located in Jackson County, West Virginia approximately 1.5 miles upstream of the community of Millwood, West Virginia. The project site is within the Racine Pool of the Ohio River. Goose Island is on the left descending bank between Ohio River Mile (ORM) 230.4 and 229.6. The project site is within the jurisdiction of the Huntington District, U.S. Army Corps of Engineers (USACE).

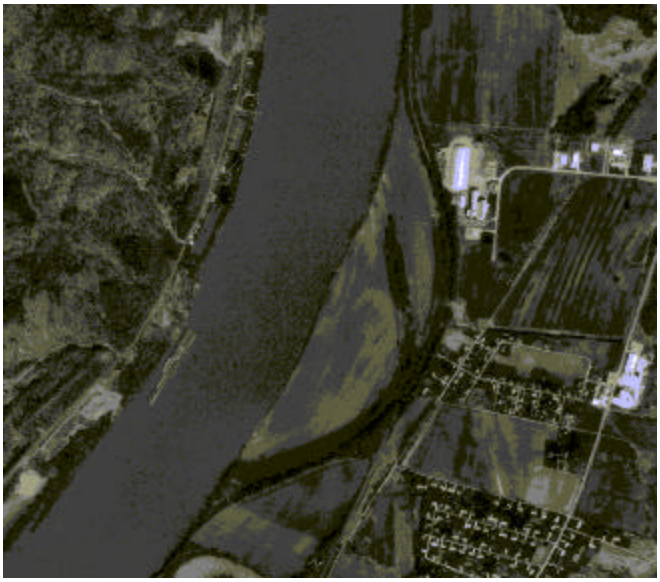


2.0 Project Goal, Description, and Rationale

The primary goal of the Goose Island Restoration project is to restore the island and associated backchannel at the site. Goose Island, is currently no longer a true island in that the upstream portions of the backchannel have silted in and terrestrial/riparian vegetation has grown-up on the site. During normal pool conditions there is not a complete backchannel at Goose Island. Currently the aquatic habitat in the former backchannel is an isolated shallow slough.

The project will result in the re-creation of the island and associated backchannel which will provide important off-channel aquatic habitat, increased aquatic habitat diversity and increased fish spawning habitat. Consequently this habitat restoration project will improve species diversity, facilitate a sustained fisheries resource, and improve the local recreational fishery.

The island will be created by cutting a new channel along the former backchannel location thereby restoring connectivity and flow through the channel.



Aerial View of Goose Island

3.0 Alternatives to Proposed Project

An alternative to the proposed backchannel restoration project would be to dredge a portion of the existing remnant backchannel and to construct a levee at the southwest end of the backchannel. The 4-5 foot high levee would retain more water in the slough during seasonal flood events thereby creating seasonally accessible deeper water slough habitat. This area would provide nursery habitat for fishes, as well as overwintering habitat for fishes and waterfowl. This alternative however, has the disadvantage of lacking the permanent connection to the Ohio River that the proposed project provides.

4.0 Existing Conditions

Terrestrial/Riparian Habitat: Goose Island is an old island with much of the original backchannel filled with sediments thereby resulting in the island becoming attached to the mainland. The terrestrial habitat on Goose Island is predominantly agricultural crops (e.g. corn, wheat, pumpkin). Riparian areas on the island are primarily limited to the river border and old backchannel border. Riparian vegetation in the area is primarily black willow (*Salix nigra*), silver maple (*Acer saccharinum*), and a variety of grasses. Wading birds (e.g. great blue heron) and waterfowl (e.g. wood ducks) also use the old backchannel in the project area.


Downstream Goose Island


Upstream Goose Island

Aquatic Habitats: Aquatic habitats at the Goose Island site include the Ohio River adjacent to the site and a shallow slough which represents the remnants of the old backchannel in the southern portion of the site. The Ohio River habitat adjacent to the site contains near shore littoral habitat as well as deeper water main channel border habitat. The existing habitat within the remnant backchannel is a shallow slough during most periods of the year. During periods of high river stage, the entire old backchannel is inundated. Throughout normal river stages the old backchannel is an isolated slough without a connection to the river. The slough/backchannel area provides habitat for a variety of fish species including largemouth bass (*Micropterus salmoides*) and bluegill (*Lepomis macrochirus*) (Sheaffer, 1986).


Goose Island Old Backchannel

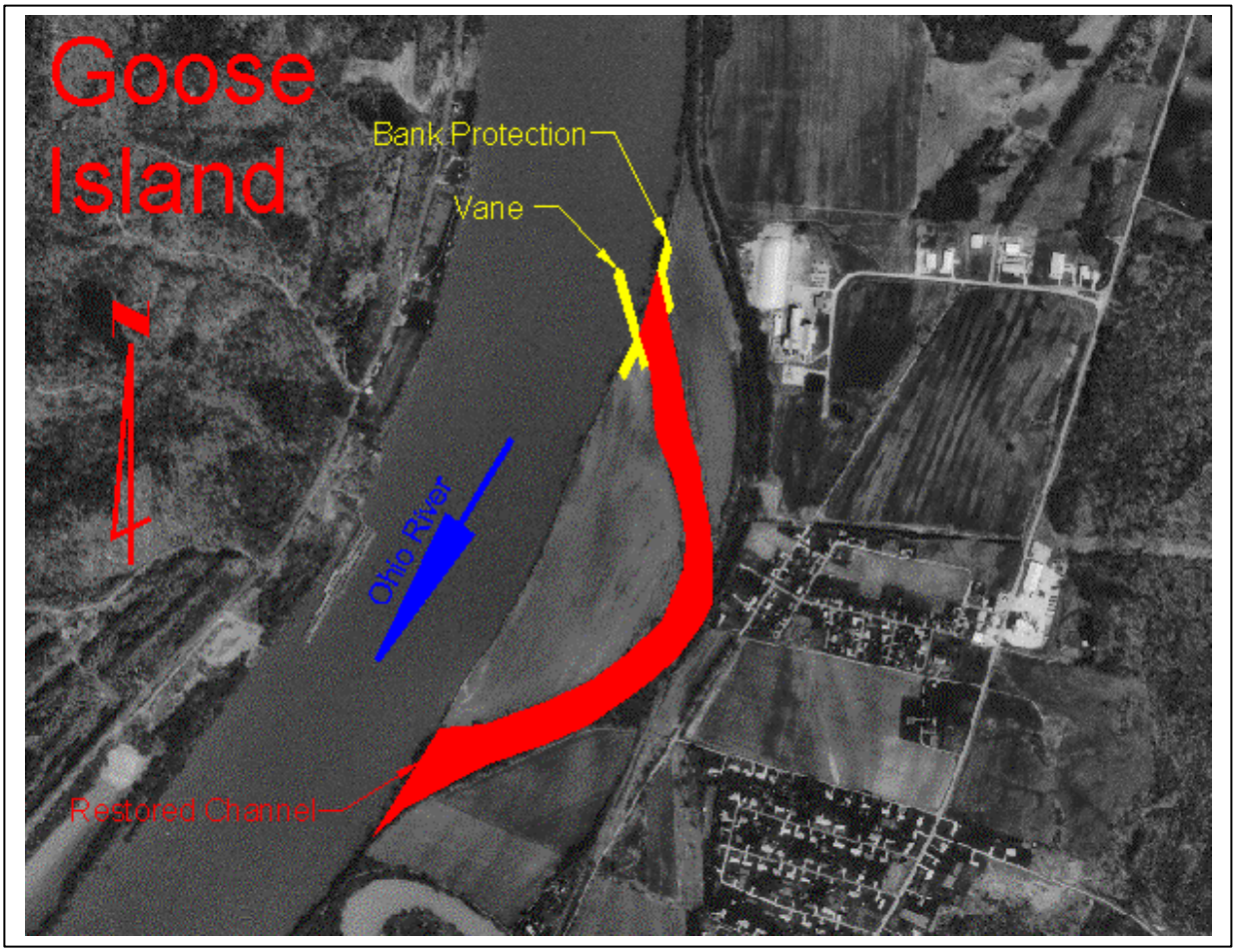
Adjacent to the Goose Island site are Ravens Aluminum Co. and the Village of Millwood. The tenant farmer on the site reports that effluent from the Village of Millwood sewage treatment plant enters the slough at Goose Island. The tenant also reports that fish kills occur annually in the slough. The cause of the fish kills has not been identified.

Wetlands: Jurisdictional wetlands occur primarily along the old backchannel and slough border. These wetlands are generally scrub shrub, herbaceous, and bottomland hardwood wetlands. Although riparian areas are abundant on the site most of these areas do not appear to be jurisdictional wetlands. Upland areas on the site are primarily agricultural in nature. The riparian habitats are located adjacent to the exisiting slough and in the filled in portions of the old backchannel.

Federally-Listed Threatened and Endangered Species: The U.S. Fish and Wildlife Service (USFWS) has indicated that one federally-listed endangered species, the fanshell mussel (*Cyprogenia stegaria*) is known to occur in Jackson County, West Virginia.

The fanshell mussel is known to occur in the Ohio River Basin in medium to large rivers in areas of gravel substrate. No reproducing populations are known to occur within the mainstem Ohio River (USFWS, 1991). Goose Island does not appear to provide the required habitat for this species.

5.0 Project Diagram



6.0 Engineering Design, Assumptions, and Requirements

6.1 Existing Ecological/Engineering Concern

The Goose Island backchannel has filled with sediments due to several factors. These factors include: raised water levels from the impoundment of Racine Pool; deposition of Ohio River silt-laden waters, especially during flood events; and wave action from barge traffic.

6.2 Island & Backchannel Creation

Restoration of Goose Island would create 28.6 acres of backchannel habitat. To restore the island and backchannel 8 acres of forested land would have to be cleared. The created channel would vary from 180 to 400 feet wide. The maximum side slope would be 3:1. Approximately 40 percent of the backchannel would be excavated by traditional methods. The remaining 60 percent would be dredged.
Dredged material disposal would be on the island. A small levee, 6 feet high and 2300 feet in length, would be constructed at the designated disposal site for dewatering. Material excavated for the channel would be used for the levee. A vane would be provided at the mouth to divert water into the channel, and provide continuous flow.

6.3 Vane

The vane would be used to divert some of the flow of water into the restored channel and provide submerged aquatic habitat The structure would be 100 feet in length, pointing upstream at a 60 degree angle. The side slopes would be 1.5 to 1, and the structure would be toed into the sub-grade a minimum of 2 feet. The channel banks would be protected 50 feet up and down stream with rip-rap. The size of the rock used shall be uniformly graded limestone with each rock weighing between 50 and 150 pounds. Normally a well-graded rock would be used, however, a uniform gradation would provide better aquatic habitat.

6.4 Bank Protection

Due to the increased velocities created at the mouth of the island, the channel bank would need to be protected.

Design Features:

- Clean slope of all trees and brush
- Excavate bank to provide a 2:1 slope
- Cover slope with a filter fabric with the following properties:

Table 2. Properties of filter fabric		
Physical Property	**Test Method**	**Requirements**
Equivalent Opening Size	Corps of Engineers CWO 2215-77	Equal to greater than U.S. No. 50 Sieve
Tensile Strength @ 20% (Maximum)	VTM-52	30 lbs./linear inch (Minimum)
Puncture Strength	ASTM D751	80 lbs. (Minimum)

- Rip-rap shall extend up the banks of the channel to a height of 12 feet vertically from the channel bottom (see figure in subsection 5).

7.0 Planning/Engineering Assumptions

Dredging

- A small auger head dredge would be used, and the material would be pumped directly to the disposal site.
- Bottom side slopes will be reshaped to a 3:1.
- All the material required for the levee would be taken from on site.
- A 2,320 gallons per minute (gpm) centrifugal pump would be used for dewatering. Dewatering would commence 18 days after dredging begins to prevent the dewatering basin from exceeding capacity.

Island Creation

- The site would be cleared of all trees and brush prior to excavation. All cleared material would be left in piles to enhance the wildlife habitat.
- Excavated material would be used to create the levee for the moist soil unit.

Vane and Bank Protection

- Average channel velocities are 3 feet per second.

- All rip-rap material would be shipped by barge to the project site. All costs for shipping are included in the material costs.

8.0 Cost Estimate (Construction):

Engineering costs for the proposed project are contained on Table 1. A detailed MCACES cost estimate for the proposed project is included in Appendix C.

Table 1. Engineering Costs.	
Item	**Cost**
Clearing	$19,600
Excavation of Backchannel	$333,600
Vane	$15,700
Bank Protection	$20,300
Dredging	$200,400
Levee	$77,300
Dewatering	$88,100
Mobilization	$45,000
TOTAL	**$800,000**

9.0 Schedule:

The estimated construction time for this project is shown on Table 2.

Table 2. Engineering Costs.	
Item	**Time**
Clearing	10 Days
Excavation of Backchannel	112 Days
Vane	5 Days
Bank Protection	3 Days
Dredging	221 Days
Levee	20 Days
Dewatering	91Days
Mobilization	6 Days
TOTAL	**468 Days**

10.0 Expected Ecological Benefits

Terrestrial/Riparian Habitats: The beneficial impacts of the Goose Island restoration project would be primarily in-stream. There would be no reasonably foreseeable beneficial impacts to terrestrial/riparian resources as a result of implementing the proposed project. Beneficial impacts would be expected, however, if the current agricultural practices ceased and reforestation occurred.

Aquatic Habitats: Long-term beneficial impacts to aquatic resources would be anticipated as a result of implementing the proposed project. Creating a backchannel at Goose Island would result in long-term beneficial impacts to fishes due to the creation of this habitat type. Backchannel habitat is sparse in the Ohio River, and the creation of additional backchannel habitat will provide improved slow flow habitat, spawning habitat, nursery habitat, potential aquatic plant habitat, and increased habitat diversity within the area. This backchannel restoration will benefit a wide variety of fishes, especially sport fish such as black basses

(Sheaffer, 1986). Additionally, re-establishing flow to the backchannel may also facilitate in the elimination of the fish kills that have been reported in the slough.

Wetlands: The beneficial impacts of the Goose Island restoration project would be primarily in-stream. There would be no other beneficial impacts to wetland resources as a result of implementing the proposed project.

Federally-Listed Threatened and Endangered Species: There would be no reasonably foreseeable beneficial impacts to the fanshell mussel as a result of implementing the proposed project.

Socioeconomic Resources: There would be short-term and long-term beneficial impacts to socioeconomic resources as a result of implementing the proposed project. The short-term beneficial impacts would be related to costs and local expenditures associated with the construction/dredging of the embayment. Long-term socioeconomic benefits would be realized through improved recreational fishing opportunities. Long-term indirect beneficial impacts will be realized through local expenditures for fishing tackle, food, gas, and other associated needs.

11.0 Potential Adverse Environmental Impacts

Terrestrial/Riparian Habitats: There would be long-term adverse impacts to terrestrial/riparian resources as a result of implementing the proposed project. Approximately 8 acres of bottomland hardwood timber would be cleared in order to create the backchannel, thereby resulting in the permanent loss of terrestrial habitat.

Aquatic Habitats: Minor adverse impacts to existing aquatic biota in the remnant backchannel (slough) may occur as a result of construction activity associated with the re-creation of the new backchannel. In addition, sensitive aquatic species immediately downstream from the site could be adversely impacted by degraded water quality associated with sediments displaced during construction, however these adverse impacts to aquatic species would be short term.

Wetlands: Potential long-term adverse impacts to jurisdictional wetlands as a result of implementing the proposed project would occur if jurisdictional wetlands are determined to be present on the site. Portions of the riparian habitat along the old backchannel may be considered jurisdictional wetlands. The function of these wetlands would be removed during the reconstruction of the new backchannel. The loss of jurisdictional wetlands would, however, be mitigated at an approved wetland mitigation site on or near Goose Island.

Federally-Listed Threatened and Endangered Species: There would be no reasonably foreseeable adverse impacts to the fanshell mussel as a result of implementing the proposed project.

Socioeconomic Resources: Minor adverse socioeconomic impacts could occur if the current agricultural activities on the island cease as a result of the proposed project.

12.0 Mitigation

Minor impacts associated with site restoration may occur during the construction of this project, however, no significant adverse impacts are expected. The use of best management practices and proper construction techniques would minimize adverse water quality impacts.

Jurisdictional wetlands (if present in the old backchannel) would be adversely impacted (removed) during the reconstruction of the new backchannel. Mitigation via the creation of new

wetlands could occur on or near Goose Island in conjunction with the recreation of the backchannel.

13.0 Preliminary Operation and Maintenance Costs:

Table 3. Operation and Maintenance Costs		
Maintenance	**Frequency**	**Costs**
Dredge Backchannel of Island	35 Years	
Repair of Rock Structures	10 years	$12,000

14.0 Potential Cost Share Sponsor(s)

- State of West Virginia Department of Natural Resources

15.0 Expected Life of the Project

It is anticipated that the recreated backchannel will maintain adequate depth and flow for a period of 35 years before maintenance dredging would be required.

16.0 Hazardous, Toxic, and Radiological Waste Considerations

The Ohio River flows from north-northeast to south-southwest past the project site located on the southeast side of the river in Jackson County, West Virginia. The small town of Estar is found on the northeast side of the natural dead-end channel which is part of the project area. Ripley Landing on Mill Creek is about 0.75 miles southwest of Estar.

The following environmental conditions were considered when conducting the June 15, 1999 project area inspection:

- Suspicious/Unusual Odors;
- Discolored Soil;
- Distressed Vegetation;
- Dirt/Debris Mounds;
- Ground Depressions;
- Oil Staining;
- Above Ground Storage Tanks (ASTs);
- Underground Storage Tanks (USTs);
- Landfills/Wastepiles;
- Impoundments/Lagoons;
- Drum/Container Storage;
- Electrical Transformers;
- Standpipes/Vent pipes;
- Surface Water Discharges;
- Power or Pipelines;
- Mining/Logging; and
- Other.

With the exception of the mining activities of Ravens Aluminum, and potential surface discharges from this operation, and reports by a tenant of sewage discharges from the town of Millwood, none of the other environmental conditions listed above were observed in the project area. A more detailed investigation of HTRW activity in the area is warranted if the project includes land acquisition.

17.0 Property Ownership & River Access

Selected data on properties immediately adjacent to the concept site was collected from the county courthouse of the respective county of each site. Data collected included map and parcel identification number, property owner's name and mailing address, acreage of the potentially affected parcel, and market value of the parcel. This procedure involved obtaining a plat or parcel map of the site and surrounding area which identified each parcel with a corresponding map and parcel number. The map/parcel identification number was subsequently used to determine the property owner's name and mailing address from records in the County Assessor's or County Auditor's office.

The market value of each parcel as contained in the property tables reflects the assessed valuation to supposedly market value ratio used by the State for taxation purposes. These assessed values reflect 1998 assessments. The assessed valuation ratio is 60 percent for West Virginia.

The above ratio was used to approximate the market value of each property. However, in many instances the resultant market value calculated under the above procedure is considerably below the actual value of the land in the real market. Local real estate brokers could provide a more accurate estimate of actual land values.

The collected property data indicate that the island and adjacent land are owned by private entities. Access to this site for the purpose of completing the proposed project will require agreements with local landowners for the construction activity associated with the creation of the island and the disposal of excavated materials. In lieu of easements or agreements, land purchase maybe an alternative for this project.

Table 4. Property Characteristics

Site Name: Goose Island
Location: Jackson County, West Virginia

Map/Parcel Number	Owner	Mailing Address	Market Value	Acreage
3/2	Kaiser Aluminum & Chemical Corporation	P.O. Box 572887 C/0 Tax Department Houston, TX 77257	$ 28,600	2.21
6/1.1	Adrian/Linda McCoy	123 Ripley Landing Road Millwood, WVA 25262	$ 3,900	60.00 (approx.)
6/3	Eastern Star Homes (Nursing Home)	1037 B Street P.O. Box 1097 Ceredo, WVA 25507	$ 116,700*	343.90
6/17.17	Valley, Inc. (sand\gravel operation)	P.O. Box 100 Millwood, WVA 25262	$ 411,500*	24.88

* Denotes improvements on property.

18.0 References

Sheaffer, 1986	Sheaffer, W.A. and J.G. Nickum. 1986. Backwater areas as nursery habitats for fishes in Pool 13 of the Upper Mississippi River. Hydrobiology No. 136 pp. 131-140.
USFWS, 1991.	U.S. Fish and Wildlife Service. 1991. Fanshell Recovery Plan. Prepared by R.G. Biggins for the Southeast Region USFWS July 9, 1991. 37pp.
USFWS, 1999	U.S. Fish and Wildlife Service, July 6, 1999. Federally Listed Endangered and Threatened Species in West Virginia.

APPENDIX A Threatened & Endangered Species

APPENDIX B Plan Formulation and Incremental Analysis Checklist

Project Site Location:

The proposed Goose Island restoration project area is located in Jackson County, West Virginia approximately 1.5 miles upstream of the community of Millwood, West Virginia. The project site is within the Racine Pool of the Ohio River. Goose Island is on the left descending bank at Ohio River Mile (ORM) 230. The project site is within the jurisdiction of the Huntington District, U.S. Army Corps of Engineers (USACE).

Description of Plan selected:

The primary goal of the Goose Island Restoration project is to create (recreate) an island and associated backchannel at the site. The project will result in the creation of an island and a backchannel which will provide important off-channel aquatic habitat, increased aquatic habitat diversity, and increased fish spawning habitat. Consequently, this habitat restoration project will improve species diversity, facilitate a sustained fisheries resource, and improve the local recreational fishery.

The island will be created by recreating the old channel along the southern portion of the site. The channel will following the existing low stream terrace (old river backchannel) at the site.

Alternatives of the Selected Plan:

Smaller Size Plans Possible? **No** and description

Larger Size Plan Possible? **No** and description

Other alternatives? **No**

Restore/Enhance/Protect Terrestrial Habitats? Yes **Objective numbers met** T2, T1

Restore, Enhance, & Protect Wetlands? Potential **Objective numbers met** W1, W3

Restore/Enhance/Protect Aquatic Habitats? Yes **Objective numbers met** A6, A2, A8

Type species benefited: Wide variety of fish species including black basses.

Endangered species benefited: None

Can estimated amount of habitat units be determined: Approximately 29 acres of backchannel habitat will be created

Plan acceptable to Resources Agencies?

U.S. Fish & Wildlife Service?

State Department of Natural Resources? Yes – West Virginia DNR

Plan considered complete? **Connected to other plans for restoration?**

Real Estate owned by State Agency? No **Federal Agency?** No
Real Estate privately owned? Adjacent land is privately owned
If privately owned, what is status of future acquisition Acquisition and/or agreements will be necessary

Does this plan contribute significantly to the ecosystem structure or function requiring restoration? What goal or values does it meet in the Ecosystem Restoration Plan?

Restores backchannel habitat. Backchannel habitat is sparse in the Ohio River and the creation of additional backchannel habitat will provide improved reduced current habitat, spawning habitat, nursery habitat, potential aquatic plant habitat and increased habitat diversity within the area. This backchannel restoration will benefit a wide variety of fishes, especially sport fish such as black basses.

Is this restoration plan a part of restoration projects planned by other agencies? (i.e. North American Waterfowl Management Plan, etc.)

No

In agencies opinion is the plan the most cost effective plan that can be implemented at this location?

Can this plan be implemented more cost effectively by another agency or institution?
Yes / No
Who:

From an incremental cost basis are there any features in this plan that would make the project more expensive than a typical project of the same nature? For embayment type plans is there excessive haul distance to disposal site? More expensive type disposal? Spoil that requires special handling/disposal?

Potential Project Sponsor:

Government Entity:_____
Non-government Entity _____

Corps Contractor _____Date_____

U.S. Fish & Wildlife Representative _____Date_____

State Agency Representative _____Date _____

U.S. Army Corps of Engineers Representative _____Date _____

Terrestrial Habitat Objectives

T1 Riparian Corridors

T2 Islands

T3 Floodplains

T4 Other unique habitats (canebrakes, river bluffs, etc.)

Wetland Habitat Objectives

W1 Forested Wetlands: Bottomland Hardwoods

W2 Forested Wetlands: Cypress/Tupelo Swamps and other unique forested wetlands

W3 Scrub/Shrub Emergent Wetlands: isolated from the river except during high water and contiguous (includes scrub/shrub wetlands in embayments and island sloughs)

Aquatic Habitat Objectives

A1 Backwaters (sloughs, embayments, oxbows, bayous, etc.)

A2 Riverine submerged and aquatic vegetation

A3 Sand and gravel bars

A4 Riffles/Runs (tailwaters)

A5 Pools (deep water, slow velocity, soft substrate)

A6 Side Channel/Back Channel Habitat

A7 Fish Passage

A8 Riparian Enhancement/Protection

APPENDIX C Micro Computer-Aided Cost Engineering System (MCACES)